

**PATENTS ACT 1977**

APPLICANT International Consolidated Airlines Group

ISSUE Whether patent application GB1715738.9 is  
excluded under section 1(2)

HEARING OFFICER H Jones

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**DECISION**

**Introduction**

- 1 Patent application GB1715738.9, now published as GB2567147, was filed in the name of International Consolidated Airlines Group on 28 September 2017.
- 2 Two examiners have been involved in the processing of this application and both are of the opinion that it relates to a computer program as such and is therefore excluded from patentability under section 1(2). The application has not been searched on the basis that a search would serve no useful purpose, as is provided for under section 17(5)(b).
- 3 The applicant has amended the claims twice and provided observations on patentability, but these have not been found to be persuasive. I have been asked to issue a decision on the papers.

**The invention**

- 4 There is a single independent claim, the latest version of which is as follows:

A method comprising:

storing, at a first computing device in a computer network, data defining a local prediction model including:

- a set of trained core parameter values received from a remote server in the computer network that maintains at least one temporally-dependent attribute of a plurality of perishable units,
- a set of trained shared parameter values received from a second computing device in the computer network, and
- a set of local parameter values generated by the first computing device;

applying, by the first computing device, a machine learning algorithm to

compute updated core, shared and local parameter values of the local prediction model based at least on data associated with the first computing device;

applying, by the first computing device, the machine learning algorithm to compute re-trained core, shared and local parameter values of the local prediction model;

communicating, by the first computing device, the updated core parameters back to the remote server;

distributing, by a model sharing module of the first computing device, the updated shared parameters to interconnected computing nodes based on geographical and/or network proximity to the device; and

processing, by the first computing device, a data query using the trained local prediction model, to identify at least one perishable unit and to predict a value of at least one temporal query attribute of the or each identified perishable unit.

- 5 In general terms, the application relates to a data query processing system, particularly for use with data relating to “perishable units”. Perishable units are defined in the application as being any form of entity which has an attribute defined by some constraint such as time and/or quantity. Unsurprisingly, given the identity of the applicant, one example of this is a purchasable ticket for a commercial travel service, but other examples include hotel rooms, restaurant reservations, or perishable physical goods stocked in a warehouse or retail environment.
- 6 Conventionally a data query processing system involves a backend server receiving and processing queries from remote computing devices across a data network. The backend server maintains a single source of up-to-date data which allows the queries to be processed. The problem with such conventional data query handling systems is that the backend server is involved in every data request, and the server is therefore prone to processing bottlenecks. This is compounded when the number of remote computing devices is increased and when the queries become more numerous and complex.
- 7 The invention adopts a different approach, based on machine learning. Rather than the backend server processing all the queries, each remote computing device is enabled to process queries itself. This is facilitated through the use of a local trained prediction model at a remote computing device. The trained model utilises parameter values, some of which are local to the device, others of which are trained values received from the backend sever, and still others are received from other remote computing devices on the network.

### **The law**

- 8 The relevant provision is section 1(2)(c) of the Patents Act 1977, which says that certain things cannot be protected by a patent:

*It is hereby declared that the following (among other things) are not inventions for the purposes of this Act, that is to say, anything which consists of -*

*(a) ...*

(b) ...

(c) ... a program for a computer;

(d) ...

but the foregoing provision shall prevent anything from being treated as an invention for the purposes of this Act only to the extent that a patent or application for a patent relates to that thing as such.

- 9 There is well-established case-law providing guidance on determining whether an invention falls within this exclusion. In *Aerotel Ltd v Telco Holdings Ltd & Ors Rev 1*<sup>1</sup> the Court of Appeal set out the following four-step test for determining whether a proposed invention is excluded under section 1(2):

- 1) properly construe the claims;
- 2) identify the actual or alleged contribution;
- 3) ask whether it falls solely within the excluded subject matter;
- 4) check whether the actual or alleged contribution is actually technical in nature.

and in *Symbian Ltd's Application*<sup>2</sup> the Court made it clear that when determining whether a proposed invention is excluded, it does not matter whether the question of "whether the contribution is technical" is asked at step (3) or (4).

- 10 The examiners have based their analysis on *Aerotel* and *Symbian* and have also made use of the signposts of *AT&T v CVON*<sup>3</sup> and *HTC/Apple*<sup>4</sup>. There is no disagreement as to the relevant law.

### **Arguments and analysis**

- 11 The examiner has summarised his position and the agent's arguments in his letter of 17 September 2021. I have considered this carefully, along with the previous correspondence on file.
- 12 There has been no dispute between the applicant and the examiner as to how the claim should be construed. Claim construction presents no particular difficulty here, at least insofar as determining the issue before me.
- 13 The examiner has set out what he considers to be the contribution in his most recent letter. The applicant set out their assessment of the contribution in earlier correspondence (though this was in respect of a previous version of the claim). Taking both into account I consider that the contribution can be defined as:

A method of processing a data query at a first computing device using a trained local prediction model to identify a perishable unit and predict value of a temporal query attribute of each identified perishable unit, comprising

storing at the first computing device storing data defining a local prediction model, the data comprising:

- trained core parameter values received from a remote server,

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<sup>1</sup> [2006] EWCA Civ 1371, [2007] RPC 7

<sup>2</sup> [2008] EWCA Civ 1066, [2009] RPC 1

<sup>3</sup> [2009] EWHC 343 (Pat)

<sup>4</sup> [2013] EWCA Civ 451

- trained shared parameter values received from another computing device in the network and

- local parameter values generated by the first computing device,

updating and retraining the core, shared and local parameters values of the local prediction model by a machine learning algorithm,

communicating the updated values back to the remote server, and to other computing devices in the network based on geographical and/network proximity to the first device.

- 14 An important part of assessing the contribution is to consider the advantages of the invention and the problem that it seeks to solve. The applicant's view is that the problem is one of overcoming server bottlenecks and that the advantage of their method is that it decreases server demand. The examiner accepts this, and likewise I have no difficulty in agreeing.
- 15 Turning to the five signposts in order to assist me in determining whether the contribution falls solely within the excluded field of a computer program, I note that the applicant has not made any argument in respect of the first and second signposts, and it is plain to see why. These signposts simply do not assist. There is clearly no effect outside of a computer (or computer system) and there is no effect that operates at the level of the architecture of the computer.
- 16 The applicant asserts that the third and fourth signposts are satisfied. The third signpost asks whether the claimed technical effect results in the computer being made to operate in a new way. The fourth asks whether the program makes the computer a better computer in the sense of it running more efficiently and effectively as a computer.
- 17 In the applicant's view, both the server and the computing device are made to operate in a new, more efficient and effective way because the computing device is modified such that it can process and resolve a data query without involving server-side resources.
- 18 For the third signpost to be satisfied there must be an effect which is more than just the running of a new program on an otherwise conventional computer, and in this case I do not see anything which points towards that. The computers operate in a new way only in the sense that they have been programmed to do something different. They may well be handling a data query in a new way, but the underlying technical operation of the computers remains unchanged.
- 19 Similarly, for the fourth signpost to be satisfied there needs to be a sense in which the computers are running more efficiently and effectively as computers, and not simply because they have been programmed to do something which is itself more efficient and effective. In my view it is clear in this case that any increase that the user may perceive in the effectiveness and efficiency of the handling of data queries is entirely dependent upon the particular manner in which those queries are processed. The computers do not run more efficiently and effectively as a result of running different programs.

- 20 The applicant has also argued that their invention also has a technical effect of improved data communication of updates between networked devices. This improved data communication, they say, enables significant scaling up of the distributed model across networked devices. There is, of course, a data communication aspect to this invention. The data that is communicated between networked devices relates to parameter values of trained prediction models, and so is quite different to the data that is communicated in conventional systems. It may well be the case that this results in less data being communicated than in conventional server-based query processing systems but there is nothing which suggests to me that there is anything in the contribution which might solve a technical problem relating to technical limitations of a process or apparatus for communicating data between networked computers.
- 21 The applicant has also relied upon the fifth signpost. They argue that the problem has been overcome and not circumvented because the capacity of the server has been improved by offloading the query processing to the remote computing device(s). I am not persuaded by this line of argument. In fact, it is quite clear that the capacity of the server has not been improved in any technical sense. The contribution may well be an elegant and efficient method of providing responses to queries, but in my view it does not overcome the technical problem at the backend server. Rather, it circumvents that problem by adopting an entirely different approach which has the effect of placing a lower processing load upon the server, but at the same time utilises much more of the processing resources of the remote computing device(s).
- 22 In view of the above, I find that the contribution falls solely within the excluded matter defined in section 1(2) i.e. it is a computer program as such. The contribution is not technical in nature. Furthermore, I can see nothing in the dependent claims or elsewhere in the application which would appear to provide the basis for a saving amendment.

### **Conclusion**

- 23 The application is refused under section 18(3).

### **Appeal**

- 24 Any appeal must be lodged within 28 days after the date of this decision.

**Huw Jones**

Deputy Director, acting for the Comptroller